

# PROVISIONAL SYNOPSIS OF THE SPECIES AND NATURAL HYBRIDS IN *DURANTA* (VERBENACEAE)

ROGER W. SANDERS

*Fairchild Tropical Garden*  
11935 Old Cutler Road, Miami, FL 33156, U.S.A.

## ABSTRACT

The taxonomy of *Duranta* L. is provisionally reviewed in the form of a synoptic key and synonymy list. Seventeen species, without infraspecific taxa, are recognized. In zones of geographic sympatry, twelve of the species have been involved in forming nineteen putative natural hybrids, eight of which have been described previously as species or varieties.

*Duranta* L. consists of several shrubby species ranging from Florida and Texas south to Argentina and Brazil. As a member of the Verbenaceae tribe Lantaneae, it is closely related to the large genus *Citharexylum* L. and *Rhaphithamnus* Miers of Latin America. However, it differs from these by the eight-loculed ovaries and by the fruiting calyces that enclose the mature mericarps. In several species the showy, bluish purple flowers and fleshy, bright yellow-orange fruits have led to their use as ornamentals.

I initiated an herbarium study of *Duranta* in anticipation of developing it as a major research project at Fairchild Tropical Garden (FTG). This would have combined the emphasis of FTG on tropical ornamentals and the Caribbean flora with both my interest in the Lamiales (Sanders, 1979; Sanders and Cantino, 1984) and my previous acquaintance with *Rhaphithamnus* (Sanders et al., 1983). However, upon borrowing specimens from the New York Botanical Garden (NY) and the Smithsonian Institution (US) (Holmgren et al., 1981), I discovered that most of the taxonomic problems are in the temperate and subtropical northern Andes, rather than in the lowlands of the Caribbean Basin. Thus, I have discontinued further study of *Duranta*.

In annotating the loans, I discovered that for a significant number of taxa my determinations differed from those previously made by Dr. Harold N. Moldenke, the foremost authority of the Verbenaceae. Actually, authors have disagreed over the disposition of species of *Duranta* throughout its history. Schauer (1847) recognized four, whereas Walpers (1845) acknowledged ten. Currently, Dr. Moldenke (*in schedula*) accepts about 30 species and 12 infraspecific taxa, but I believe there are only 17 species, none of which has well marked geographically coherent subdivisions. I agree with Dr. Moldenke that considerable variation exists in *Duranta*. However, many of the variants, which include named species, appear to be morphologically



intermediate to other more widespread taxa, as well as appear to occupy zones of geographic sympatry of those taxa. This suggests that the variants are hybrids or taxa of hybrid origin. Although there is not yet any direct evidence for hybrids, I have demonstrated natural hybridization in the related woody genus *Lantana* (unpublished). Because Dr. Moldenke apparently plans to revise *Duranta* (He has recently published revisions of a number of other genera (e.g., 1981a, b, c).) and because of my small sample, I see no need to provide complete descriptions but only to present a contrasting hypothesis of species delimitations. This synoptical treatment includes a key to species, a list of putative natural hybrids, synonymies, and abbreviated references to type specimens seen in the above loans. It is my hope that this paper will encourage other botanists to pursue the required field and laboratory studies to test the hypotheses herein proposed.

#### TAXONOMY

##### DURANTIA L.

DURANTA L., Sp. Pl. ed. 1, 637. 1753. LECTOTYPE: *Duranta erecta* L. (= *D. repens* L.). Lectotypification was by Hitchcock and Greene (1929) but may not be justified. They argue that, as of 1929, a type for *D. erecta* had been identified, whereas none for *D. repens* had been found. Moldenke and Moldenke (1983), however, cite specimen 806.1 in the Linnean Herbarium as the type of *D. repens*. Therefore, an indepth study into the lectotypifications of the two Linnean species names and of *Duranta* is needed.

#### KEY TO SPECIES

1. Thorns twig-like, composed of several nodes and internodes, often bearing bracts or reduced leaves, stout and abruptly aculeate at apex; Andes of northern Peru ..... *D. cajamarcensis* Mold.
1. Thorns spine-like, composed of a single smooth internode, rarely with a single node bearing a pair of subsidiary thorns, rather slender and tapering aciculate ..... 2
2. Inflorescence branches (esp. axillary ones) leafy, with at least 3 to 5 well developed leaves below the flowering portion or subtending the lower flowers ..... 3
3. Leaves, branches and thorns decussate; thorns poorly developed, if present mostly shorter than leaves; axillary short-shoots with fascicled leaves usually poorly developed ..... 4
4. Twigs tomentose and undersurface of leaves pubescent with spreading curled hairs; calyx 6–7 mm long, apicules (tips of calyx-teeth) 1.0–1.5 mm long; fruiting calyx closed at apex; corolla-tube ca 2 times longer than calyx (incl. apicules); lower elevations of southeast Brazil and adj. Argentina .. *D. vestita* Cham.
4. Twigs and undersurface of leaves glabrescent with scattered appressed hairs; calyx 3–5 mm long, apicules 0.5–1.0 mm long, fruiting calyx open at apex; corolla-tube ca 3 times longer than calyx; Bolivia and northern central Argentina ..... *D. serratifolia* (Griseb.) Kuntze
3. Leaves, branches and thorns mostly ternate or alternate; thorns well developed at most nodes, mostly longer than leaves; axillary short-shoots with fascicled leaves well developed ..... 5



5. Flowering calyx 3–4 mm long, mouth nearly truncate, the apicules less than 0.5 mm long, the tomentose sinus ornamentations broadly triangular and present only at mouth of calyx-tube; fruiting calyx open at apex; Andes of southern Peru ..... *D. armata* Mold.
5. Flowering calyx (4–)4.5–8.0 mm long, mouth apiculate-sinuate, the apicules 0.5–1.0 mm long, the tomentose sinus ornamentations long triangular and extending down calyx-tube; fruiting calyx closed at apex ..... 6
6. Leaf-blades mostly 0.5–1.7 cm long, usually glabrous; calyx 4–5 mm long; West Indies ..... *D. arida* Britton & Wilson
6. Leaf-blades mostly 1.8–3.0 cm long, usually pubescent on undersurface; calyx 5–7 mm long; Andes of Ecuador and adj. Colombia and Peru ..... *D. triacantha* A. L. Juss.
2. Inflorescence branches bracteate or with 1 or 2 much reduced leaves below the flowering portion ..... 7
7. Margin of leaf-blades flat, not revolute (except slightly at base); leaf-lamina rather flat, not rugose, upper surface dull, glabrous, glabrescent or with a gray felt-like indumentum ..... 8
8. Leaves ovate-lanceolate, long attenuate at apex; inflorescence consisting of only about three racemose branches (terminal branch + two axillary branches), individual branches mostly 20–40 cm long, thin and lax-pendulous; Martinique and cultivated ..... *D. stenostachya* Todaro
8. Leaves ovate, elliptic or oblanceolate, rounded to acute or acuminate at apex; inflorescence consisting of 5 to 10 or more racemose branches (racemes or compound racemes), the lower ones often developed in the axils of foliage leaves, individual branches mostly 5–15 cm long, often arching or recurved but rather stout and not pendulous ..... 9
9. Both surfaces of leaf with a velutinous or tomentose felt-like indumentum; Andes of southern Peru ..... *D. peruviana* Mold.
9. Mature leaves glabrous, glabrescent or appressed pubescent but hairs not forming a continuous felt-like indumentum on both surfaces ..... 10
10. Leaves coriaceous; flowering calyx 6.5–8.0 mm long, calyx-tube (especially the thickened ribs) glabrous to glabrescent (not to be confused with the dense internal hairs protruding from mouth of calyx), calyx-teeth triangular or attenuate but not apiculate or subulate; fruiting calyx closed with a straight or slightly curved beak 2.5–5.0 mm or more long; Andes of Colombia and Ecuador and adj. Peru ..... *D. obtusifolia* HBK
10. Leaves membranous, chartaceous or subsucculent; flowering calyx 2.5–5.5 (–6.5) mm long including calyx-teeth (If the calyx is longer than 5.5 mm, then the calyx-tube is pubescent on the outside and calyx-teeth are apiculate-subulate.); fruiting calyx twisted or open at the apex but not forming a straight or slightly curved beak 2.5–5.0 mm long ..... 11
11. Flowering calyx tubular, apicules mostly 0.5–1.0 mm long; fruiting calyx closed at apex with a more or less twisted beak 0.5–2.0 mm long; corolla-tube (6–)7–9



- mm long, ca 2 times or less as long as the calyx including apicules; southern US to Brazil and cultivated *D. repens* L.
11. Flowering calyx campanulate, apicules 0.5 mm or less long; fruiting calyx open at apex; corolla tube ca 3 times longer than calyx ..... 12
12. Leaves long elliptic or oblanceolate, entire, subsucculent with the secondary veins (those arising from the midrib or primary vein) obscure and more or less opposite; calyx apicules ca 0.1–0.2 mm long; corolla tube ca 8 mm or less long; Amazon and Orinoco Basins of Colombia ..... *D. woronowii* Mold.
12. Leave ovate or broadly elliptic, usually sharply serrate, membranous with the secondary veins raised (below) and more or less alternate; calyx apicules mostly 0.3–0.5 mm long; corolla tube (9-)10–12 mm long, lower and middle slopes of Andes of Bolivia and northern Argentina ... *D. serratifolia* (Griseb.) Kuntze
7. Margin of leaf-blades revolute; leaf-lamina rugose, upper surface shiny or also with a brownish tomentose-lanate indumentum ..... 13
13. Leaf-blades tomentose-lanate above, pubescent below, obovate to rounded elliptic; calyx 3–4 mm long; corolla-tube (9-)10–14 mm long; Andes of southern Colombia to central Peru ..... *D. dombeyana* Mold.
13. Leaf-blades at least glabrescent or shiny above, of various shapes; calyx 5–9 mm long; corolla-tube mostly less than 10 mm long ..... 14
14. Mature twigs glabrescent or puberulent; leaf-blades 1–6(-8) cm long, undersurface glabrous or glabrescent with scattered hairs or with pubescent veins ..... 15
15. At anthesis leaves on the long-shoots caducous and absent but fascicled leaves well developed and present; leaf-blades obovate to oblanceolate; individual racemes mostly 1–4 cm long; calyces mostly 5–7 mm long, the apicules 0.5 mm or less long; southern Mexico and Central America ..... *D. guatemalensis* Mold.
15. At anthesis leaves on the long-shoots persistent but fascicled leaves lacking or poorly developed; leaf-blades lanceolate or ovate to obovate; individual racemes mostly 4–15 cm long; calyces mostly 8–9 mm long, the apicules 0.7–1.5 mm long ..... 16
16. Leaf-blades mostly 2.5–6.0 cm long, ovate, oblong or broadly oblong-elliptic, apex acute or acuminate; Andes and other mts. from Venezuela to Peru ..... *D. mutisii* L. f.
16. Leaf-blades mostly 1–2(-3) cm long, obovate to long elliptic, apex rounded or retuse, mucronate; Andes from Colombia to Bolivia ..... *D. mandonii* Mold.
14. Mature twigs  $\pm$  tomentose; leaf-blades (3-)6–12 cm long, undersurface tomentose or pubescent with spreading hairs ..... 17
17. Leaf-blades mostly narrowly ovate, apex attenuate; calyx-apicules ca 2 mm long; Central America ..... *D. costaricensis* (J. D. Smith) Standl.
17. Leaf-blades mostly ovate to elliptic, apex acute; calyx-apicules ca 1 mm long; Andes from Venezuela to Bolivia ..... *D. sprucei* Briq.

## SPECIES: SYNONYMIES, TYPES SEEN, AND NOTES

1. *DURANTA REPENS* L., Sp. Pl. ed. 1, 637. 1753. PROBABLE TYPE: Linn.



Herb. 806.1 (Microfiche!-IDC 177, card 422, row 1, column 5). Kuntze (1891) was the first author to combine *D. repens* and *D. erecta* and, in so doing, gave priority to *D. repens*.

*Duranta erecta* L., Sp. Pl. cd. 1, 637. 1753. POSSIBLE TYPE: Linn. Herb. 806.2 (Microfiche!-IDC 177, card 422, row 1, column 6).

*Duranta ellisia* Jacq., Enum. Pl. Carib. 26. 1760.

*Duranta plumieri* Jacq., Select. Stirp. Amer. Hist. 186, pl. 176, fig. 76. 1763.

*Duranta racemosa* Mill., Gard. Dict., ed. 8, 1768. "Durantia racemosa". TYPE: JAMAICA. *Houston s.n.* (Photo: NY!).

*Duranta angustifolia* Salisb., Prod. Stirp. Hort. Allerton 108. 1796.

*Duranta latifolia* Salisb., Prod. Stirp. Hort. Allerton 108. 1796.

*Duranta dentata* Rich. ex Pers., Syn. Pl. 2:142. 1806.

*Duranta xalapensis* HBK., Nov. Gen. Sp. 2:255. 1818. TYPE: MEXICO. *Humboldt & Bonpland s.n.* (Microfiche!-IDC 6209, card 47, row 2, column 1).

*Duranta microphylla* Desf., Cat. Hort. Paris (Tabl. Ecole Bot., ed. 3) 392. 1829.

*Duranta repens* var. *microphylla* (Desf.) Mold., Phytologia 1:483. 1941.

*Duranta plumieri* var. *strigillosa* Schauer in Mart., Fl. Braz. 9:271. 1851.

*Duranta integrifolia* Todaro, Nuovi Gen. Nuove Sp. Palermo 27. 1858.

*Duranta turbinata* Todaro, Nuovi Gen. Nuove Sp. Palermo. 28. 1858.

*Duranta parviflora* Turcz., Bull. Soc. Nat. Moscow 36(2): 210. 1863.

*Duranta repens* var. *canescens* Mold., Phytologia 1:436. 1940.

*Duranta peruviana* Mold. var. *longipedicellata* Mold., Bull. Torrey Bot. Club 68:502. 1941. TYPE: *Herrera* 3209 (Photo of HOLOTYPE: NY!).

*Duranta repens* var. *serrata* Mold., Phytologia 7:81. 1959. TYPE: *Venturi* 9059 (HOLOTYPE: NY!).

*Duranta repens* var. *lopez-palacii* Mold., Phytologia 26:177. 1973. TYPE: *Ruiz & Lopez* 1923 (HOLOTYPE: NY!).

Kuntze (1891) published what appears to be eight varietal names under *D. repens*:  $\alpha$  *multidentata*,  $\beta$  *paucidentata*,  $\phi$  *mutisii*, 1. *acuta*, 2. *obtusifolia*, 3. *acuminata*, a) *glabrifolia*, and b) *vestita*. The first three are based on characters of the leaf margin; the next three on leaf apices; and the last two on leaf indument. Upon closer inspection, it is clear that Kuntze intended that for any given plant the varietal name is to be a combination of three epithets, depending on the expression of the three leaf characters. Thus, for the taxon that I interpret as *D. costaricensis*, Kuntze gives the name *D. repens* var. *mutisii* & *acuminata* & *vestita*. In that a given name can be used with two or more taxa and the varietal names are not single epithets, I conclude that none of the above names are validly published (International Code of Botanical Nomenclature, Arts. 24.1, 32.1, 33.1, and 34.1b).

*Duranta repens* is very variable, especially with respect to habit, to the overall shape, margins and apex of the leaf, and to the presence and size of thorns. It is also subject to pathological elongation of the calyx and corolla. The variation is not well correlated with geography. However, specimens from the montane region of extreme northeastern Colombia to central Venezuela probably form a distinctive geographic race. If recognized, it would take the name *D. repens* var. *canescens* (incl. *D. repens* var. *lopez-palacii*). *Duranta peruviana* and *D. stenostachya* may be conspecific with



*D. repens*, each forming a geographic race. However, much more work is needed to delimit all the geographic subdivisions of *D. repens*; until then, infraspecific taxa should not be recognized.

Moldenke also recognizes as taxa three other variants that are found mostly in cultivation. These are relegated to the status of cultivars.

a. *D. REPENS* 'Alba'

*D. plumieri* var. *alba* Masters, Gard. Chron. 63 (ser 3, 3):44. 1888.

*D. erecta* var. *alba* (Masters) Caro, Rev. Argent. Agron. 23:11. 1956.

*D. repens* var. *alba* (Masters) Mold., Phytologia 41:449. 1979.

b. *D. REPENS* 'Macrodonata'

*D. macrodonata* Mold., Phytologia 2:16. 1941. TYPE: 21 Oct 1924, Nur & Ghose s.n. (Photo of HOLOTYPE: NY!).

c. *D. REPENS* 'Grandiflora'

*D. repens* var. *grandiflora* Mold., Phytologia 2:17. 1941.

*D. erecta* var. *grandiflora* (Mold.) Caro, Rev. Argent. Agron. 23:10. 1956.

2. *DURANTA STENOSTACHYA* Todaro, Nuovi Gen. Nuove Sp. Palermo 26. 1858. POSSIBLE TYPE: Plate 3, Tod. Herb. Bot. Palermo in Herb. Berlin (Photo of plate: NY!).

3. *DURANTA PERUVIANA* Mold., Bull. Torrey Bot. Club 68:501. 1941. TYPE: Soukup 825 (Fragment of HOLOTYPE: NY!).

4. *DURANTA OBTUSIFOLIA* HBK., Nov. Gen. Sp. 2:254. 1818. TYPE: PERU. Humboldt & Bonpland s.n. (Microfiche!-IDC 6209, card 47, row 1, column 7).

*Duranta coriacea* Hayek, Fedde Rep. Nov. Sp. 2:88. 1906.

5. *DURANTA WORONOWII* Mold., Bull. Torrey Bot. Club 68:503. 1941. TYPE: Woronow & Juzepczuk 6243 (Photo of HOLOTYPE: NY!).

6. *DURANTA SERRATIFOLIA* (Griseb.) Kuntze. Rev. Gen. 3(2):251. 1893.

*Myrtus serratifolia* Griseb., Pl. Lorentz. 91, t.1, fig. 4. 1874. PROBABLE TYPE: Lorentz & Hieronymus 491 (Photo: NY!).

*Duranta lorentzii* Griseb., Symb. Fl. Argent. (Goett. Abh. 24):280. 1879. PROBABLE TYPE: Lorentz & Hieronymus 491 (Photo: NY!).

*Duranta serratifolia* var. *punctata* Caro, Rev. Argent. Agron. 23:19. 1956.

7. *DURANTA VESTITA* Cham., Linnaea 7:115. 1832.

*Duranta plumieri* var. ( $\beta$ ) *vestita* (Cham.) Schauer in Mart., Fl. Braz. 9:271. 1851.

8. *DURANTA MUTISII* L. f., Suppl. Pl. 291. 1781. PROBABLE TYPE: Mutis 6, Linn. Herb. 803.3 (Photo: NY!).

*Duranta macrocarpa* HBK., Nov. Gen. Sp. 2:255. 1818. TYPE: Humboldt & Bonpland s.n. (Photo: NY!; Microfiche!-IDC 6209, card 47, row 2, column 2).

*Duranta brachypoda* Todaro, Nuovi Gen. Nuove Sp. Palermo 24. 1858.

*Duranta steyermarkii* Mold., Fieldiana, Bot. 28(3):515. 1953. TYPE: Steyermark 62102 (HOLOTYPE: NY!).



*Duranta mutisii* f. *serrulata* Mold., Phytologia 23:454. 1972. TYPE: *Allart* 325 (HOLOTYPE: NY!).

*Duranta boekei* Mold., Phytologia 40:260. 1978. TYPE: *Boeke* 644 (HOLOTYPE & ISOTYPE: NY!).

*D. mutisii* is rather variable with regard to leaf shape and size and other features, and it may possibly include *D. sprucei* and *D. mandonii*.

9. DURANTA MANDONII Mold., Lilloa 5:390. 1940. TYPE: *Mandon* 533 (HOLOTYPE & ISOTYPE: NY!).

10. DURANTA SPRUCEI Briq., Bull. Herb. Boiss. 4:344. 1896. TYPE: *Spruce* 5526 (ISOTYPE: NY!).

*Duranta benthamii* Briq., Bull. Herb. Boiss. 4:343. 1896. PROBABLE TYPE: *Mandon* 534 (ISOTYPE: NY!).

*Duranta tomentosa* Hayek, Fedde Rep. Nov. Sp. 2:88. 1906.

*Duranta pseudorepens* Mold., Phytologia 1:460. 1940. TYPE: *Spruce* 6042 (HOLOTYPE: NY!).

*Duranta sprucei* var. *columbiensis* Mold., Phytologia 2:18. 1941. TYPE: *Apolinar-María* 263 (Photo: NY!).

*Duranta sprucei* var. *breviracemosa* Mold., Phytologia 2:409. 1948. TYPE: *Haught* 6097 (HOLOTYPE: NY!; ISOTYPE: US!).

*Duranta dombeyana* Mold. var. *espinosae* Mold., Phytologia 9:186. 1963. TYPE: *Espinosa* 1815 (HOLOTYPE: NY!).

*Duranta sprucei* var. *cotopaxiensis* Mold. Phytologia 51:244. 1982.

*Duranta sprucei* is rather variable with respect to leaf shape, to density of foliar hairs, to thorn development, and to length of the racemes. This may stem from hybridization rather than geographic variation. As Moldenke's varieties seem to be sympatric with the more typical plants, I prefer not to recognize them as taxonomic varieties.

11. DURANTA COSTARICENSIS (J. D. Smith) Standl., Field Mus. Publ. Bot. 18(3/4):1005. 1938.

*Duranta mutisii* var. *costaricensis* J. D. Smith. Bot. Gaz. 20:9. 1895. TYPE: *Cooper* 6007 (LECTOTYPE?: US!; ISOTYPES: NY! US!).

12. DURANTA GUATEMALENSIS Mold., Bull. Torrey Bot. Club 68:501. 1941. TYPE: *Heyde & Lux* 2947 (Photo and fragments of HOLOTYPE: NY!; ISOTYPES: US!).

13. DURANTA DOMBEYANA Mold., Bull. Torrey Bot. Club 68:500. 1941. TYPE: *Rose et al.* 23347 (HOLOTYPE: NY!; ISOTYPE: US!).

The pubescence may slough off the upper surface of the leaves with age, but the species is distinct because of the long corolla tubes and very short calyces.

In NY there is a photograph of *Ruiz & Pavon s.n.* from Huassahuassi, Junín, Peru that is annotated by Dombey as *D. tomentosa* and by McBride as *D. dombeyi*. The latter name appears not to have been published.

14. DURANTA TRIACANTHA A. L. Juss., Ann. Mus. Paris 7:77. 1806. PROBABLE TYPE: Spec. Herb. Juss. (Photo: NY!).



*Duranta hitchcockii* Mold., Phytologia 1:460. 1940. TYPE: *Hitchcock* 20821 (HOLOTYPE: NY!; ISOTYPE: US!).

15. DURANTA ARIDA Britton & Wilson, Mem. Torrey Bot. Club 16:96. 1920. TYPE: *Shafer* 7904 (HOLOTYPE: NY!).

*Duranta crecta* var. *domingensis* Urban, Symb. Antill. 7:355. 1912. *D. repens* var. *domingensis* (Urban) Mold., Rev. Sudam. Bot. 4:17. 1937. *D. arida* var. *domingensis* (Urban) Mold., Carib. Forest. 2:13. 1940.

*Duranta fletcheriana* Mold., Carib. Forest. 2:13. 1940. TYPE: *Leon* 10865 (HOLOTYPE: NY!).

16. DURANTA ARMATA Mold., Bull. Torrey Bot. Club 68:499. 1941. TYPE: *Herrera* 85 (Photo and fragment of HOLOTYPE: NY!).

17. DURANTA CAJAMARCENSIS Mold., Phytologia 17:344. 1968.

I saw only two specimens (MO) annotated by Dr. Moldenke as belonging to this species. The material lacked good flowers and fruits, but the twiglike thorns were apparent. If the thorn character is consistent, this is probably a distinct species; otherwise, it may be only a variant of *D. triacantha*.

#### PUTATIVE NATURAL HYBRIDS AND SYNONYMIES

##### 1a. DURANTA REPENS X VESTITA

*Duranta vestita* var. *glabrescens* Mold., Phytologia 2:364. 1947. TYPE: 14 Dec 1938, *Kiehl & Costa s.n.* (HOLOTYPE: NY!).

*Duranta parvifolia* Mold., Phytologia 2:464. 1948. TYPE: *Barreto* 11057 (HOLOTYPE: NY!).

As one of Dr. Moldenke's varietal epithets suggests, this hybrid is similar to *D. vestita* but lacks the dense hairs.

##### 1b. DURANTA REPENS X ARIDA

*Duranta wrightii* Mold., Phytologia 3:60. 1949. TYPE: *Wright* 1358 (HOLOTYPE: NY!).

This hybrid usually has the ternate thorns of *D. arida*, but the leaves are larger and not as distinctly fascicled.

##### 1c. DURANTA REPENS X COSTARICENSIS

Leaves less coriaceous, rugose, and pubescent than in *D. costaricensis*.

Other specimens suggest hybrids between *D. repens* and other species, including *D. mutisii* and *D. sprucei*, but the species pairs are not geographically sympatric, arguing against hybridization.

##### 2a. DURANTA OBTUSIFOLIA X MUTISII

This is recognized by the leaves with an intermediate development of revolute margins, acute to cuspidate apices, shiny surfaces, rugose laminae and by the glabrescent calyx.

##### 2b. DURANTA OBTUSIFOLIA X MANDONII



Similar to 2a, but leaves smaller and more obovate.

2c. *DURANTA OBTUSIFOLIA* X *SPRUCI*

Similar to 2a, but with the leaves pubescent below.

2d. *DURANTA OBTUSIFOLIA* X *TRIACANTHA*

Leaves smaller and more rounded than in *D. obtusifolia*, with the ternate thorns of *D. triacantha* and calyces of *D. obtusifolia*.

3a. *DURANTA SERRATIFOLIA* X *SPRUCI*

*Duranta recurvistachys* Rusby, Phytologia 1:73. 1934. TYPE: *Bang* 1798 (HOLOTYPE & ISOTYPES: NY!).

Leaves barely revolute, serrate but somewhat coriaceous and rugose; calyx smaller than in *D. sprucei*.

4a. *DURANTA MUTISII* X *SPRUCI*

Most plants of this combination show leaves of intermediate shape and/or abaxial pubescence.

4b. *DURANTA MUTISII* X *TRIACANTHA*

Ternate thorns; leaves more obovate and somewhat smaller than in *D. mutisii* but rather revolute and rugose; the racemes usually leafy.

4c. *DURANTA MUTISII* X *ARMATA*

*Duranta lineata* Hayek in Urban, Bot. Jahrb. 42:170. 1908. TYPE: *Weberbauer* 3286 (Photo: NY!).

Well developed alternate or ternate thorns; leaves as in 4b, usually not strongly fascicled; calyces shorter than in *D. mutisii* but with rather long apicules.

5a. *DURANTA MANDONII* X *TRIACANTHA*

Similar to 4b, but leaves smaller and more obovate-spatulate.

5b. *DURANTA MANDONII* X *ARMATA*

*Duranta rupestris* Hayek in Urban, Bot. Jahrb. 42:171. 1908. TYPE: *Weberbauer* 1759 (Photo: NY!).

Similar to *D. armata*, but leaves somewhat larger, revolute, and rugose; calyces 4–8 mm long.

6a. *DURANTA SPRUCI* X *TRIACANTHA*

*Duranta penlandii* Mold., Phytologia 1:461. 1940. TYPE: *Penland & Summers* 958 (HOLOTYPE: NY!).

Similar to 4b, but leaves pubescent below.

6b. *DURANTA SPRUCI* X *ARMATA*

Similar to 4c, but leaves pubescent below.



## 7a. DURANTA DOMBEYANA X MUTISII

With the leaves of *D. mutisii* and flowers of *D. dombeyana*.

## 7b. DURANTA DOMBEYANA X MANDONII

*Duranta skottsbergii* Mold., Bull. Torrey Bot. Club 68:502. 1941. TYPE: *Macbride & Featherstone 1484* (Fragments and photo of HOLOTYPE: NY!; ISO-TYPE: US!).

With the leaves of *D. mandonii* and flowers of *D. dombeyana*.

## 7c. DURANTA DOMBEYANA X TRICANTHA

Ternate thorns; leaves rather tomentose, fascicled; calyx 5–7 mm long and corolla tube long exserted.

## 7d. DURANTA DOMBEYANA X ARMATA

Similar to 7c, but thorns less consistently ternate and leaves smaller.

## EXCLUDED SPECIES

DURANTA FISCHERI Mart., Herb. Fl. Braz. 21(2): Beibl. 60. 1838.

= *Casselia integrifolia* Nees & Mart. var *fischeri* (Mart.) Mold.

DURANTA PEARCEI Rusby, Bull. N.Y. Bot. Gard. 4:433. 1907.

= *Bredemeyera densiflora* A. W. Benor (Polygalaceae).

DURANTA JOERGENSENII Lillo, Prim. Reun. Nac. Soc. Argent. Cienc. Nat. (Tucuman) 224. 1919.

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